TABLE A

Component assembly	Drawing number
Head Assembly	921022–001.
Neck Assembly (complete)	921022–041.
Torso Assembly	921022–060.
Leg Assembly	921022–055 R&L.
Arm Assembly	921022–054 R&L.

(c) Adjacent segments of the dummy are joined in a manner such that, except for contacts existing under static conditions, there is no contact between metallic elements throughout the range of motion or under simulated crash impact conditions.

(d) The structural properties of the dummy are such that the dummy shall conform to this Subpart in every respect before its use in any test under this chapter.

§ 572.152 Head assembly and test procedure.

(a) The head assembly (refer to § 572.150(a)(1)(i)) for this test consists of the assembly (drawing 921022–001), triaxial mount block (SA572–80), and 3 accelerometers (drawing SA572–S4).

(b) *Frontal and rear impact.* (1) Frontal impact. When the head assembly in paragraph (a) of this section is dropped from a height of 376.0±1.0 mm (14.8±0.04 in) in accordance with paragraph (c)(3)(i) of this section, the peak resultant acceleration measured at the head CG shall not be less than 100 g or more than 120 g. The resultant acceleration vs. time history curve shall be unimodal, and the oscillations occurring after the main pulse shall be less than 17 percent of the peak resultant acceleration. The lateral acceleration shall not exceed ±15 g's.

(2) *Rear impact.* When the head assembly in paragraph (a) of this section is dropped from a height of 376.0±1.0 mm (14.8±0.04 in) in accordance with paragraph (c)(3)(ii) of this section, the peak resultant acceleration measured at the head CG shall be not less than 55 g and not more than 71 g. The resultant acceleration vs. time history curve shall be unimodal, and the oscillations occurring after the main pulse shall be less than 17 percent of the peak resultant acceleration. The lateral acceleration shall not exceed ±15 g's.

(c) *Head test procedure.* The test procedure for the head is as follows:

(1) Soak the head assembly in a controlled environment at any temperature between 18.9 and 25.6 °C (66 and 78 °F) and at any relative humidity between 10 and 70 percent for at least four hours prior to a test. These temperature and humidity levels shall be maintained throughout the entire testing period specified in this section.

(2) Before the test, clean the impact surface of the head skin and the steel impact plate surface with isopropyl alcohol, trichlorethane, or an equivalent. Both impact surfaces shall be clean and dry for testing.

(3)(i) For a frontal impact test, suspend the head assembly with its midsagittal plane in vertical orientation as shown in Figure R1 of this subpart. The lowest point on the forehead is 376.0±1.0 mm (14.8 ±0.04 in) from the impact surface. The 3.30 mm (0.13 in) diameter holes located on either side of the dummy's head are used to ensure that the head is level with respect to the impact surface. The angle between the lower surface plane of the neck transducer mass simulator (drawing 910420–003) and the plane of the impact surface is 45 ±1 degrees.

(ii) For a rear impact test, suspend the head assembly with its midsagittal plane in vertical orientation as shown in Figure R2 of this subpart. The lowest point on the back of the head is 376.0±1.0 mm (14.8 ±0.04 in) from the impact surface. The 3.30 mm (0.13 in) diameter holes located on either side of the dummy's head are used to ensure that the head is level with respect to the impact surface. The angle between the lower surface plane of the neck transducer structural replacement (drawing 910420–003) and the impact surface is 90 ±1 degrees.

(4) Drop the head assembly from the specified height by a means that ensures a smooth, instant release onto a rigidly supported flat horizontal steel plate which is 50.8 mm (2 in) thick and 610 mm (24 in) square. The impact surface shall be clean, dry and have a micro finish of not less than 203.2×10^{-6} mm (8 micro inches) (RMS) and not more than 2032.0×10^{-6} mm (80 micro inches) (RMS).

(5) Allow at least 2 hours between successive tests of the head assembly

at the same impact point. For head impacts on the opposite side of the head, the 30-minute waiting period specified in §572.155(m) does not apply.

§572.153 Neck-headform assembly and test procedure.

(a) The neck and headform assembly (refer to §§572.150(a)(1)(ii) and 572.150(a)(1)(iii)) for the purposes of this test consists of parts shown in CRABI neck test assembly (drawing TE–3200–100);

(b) When the neck and headform assembly, as defined in §572.153(a), is tested according to the test procedure in §572.153(c), it shall have the following characteristics:

(1) *Flexion.* (i) Plane D referenced in Figure R3 of this subpart shall rotate in the direction of pre-impact flight with respect to the pendulum's longitudinal centerline not less than 75 degrees and not more than 86 degrees. Within this specified rotation corridor, the peak positive moment about the occipital condyles shall be not less than 36 N-m (26.6 ft-lbf) and not more than 45 N-m (33.2 ft-lbf).

(ii) The positive moment about the occipital condyles shall decay for the first time to 5 N-m (3.7 ft-lbf) between 60 ms and 80 ms after time zero.

(iii) The moment about the occipital condyles shall be calculated by the following formula: Moment (N-m) = My − (0.005842m) × (Fx), where My is the moment about the y-axis, Fx is the shear force measured by the neck transducer (drawing SA572 –S23) and 0.005842m is the distance from the point at which the load cell measures the force to the occipital condyle.

(2) *Extension.* (i) Plane D referenced in Figure R4 of this subpart shall rotate in the direction of preimpact flight with respect to the pendulum's longitudinal centerline not less than 80 degrees and not more than 92 degrees. Within the specified rotation corridor, the peak negative moment about the occipital condyles shall be not more than −12 Nm (−8.9 ft-lbf) and not less than −23 N-m (−17.0 ft-lbf) within the minimum and maximum rotation interval.

(ii) The negative moment about the occipital condyles shall decay for the first time to −5 Nm (−3.7 lbf-ft) between 76 ms and 90 ms after time zero.

(iii) The moment about the occipital condyles shall be calculated by the following formula: Moment (N-m) = My − (0.005842m) × (Fx), where My is the moment about the y-axis, Fx is the shear force measured by the neck transducer (drawing SA572 –S23) and 0.005842m is the distance from the point at which the load cell measures the force to the occipital condyle.

(c) *Test procedure.* (1) Soak the neck assembly in a controlled environment at any temperature between 20.6 and 22.2 °C (69 and 72 °F) and at any relative humidity between 10 and 70 percent for at least four hours prior to a test. These temperature and humidity levels shall be maintained throughout the testing period specified in this section.

(2) Torque the jam nut (drawing 9001336) on the neck cable (drawing ATD–6206) to 0.2 to 0.3 Nm (2–3 in-lbf).

(3) Mount the neck-headform assembly, defined in paragraph (b) of this section, on the pendulum so the midsagittal plane of the headform is vertical and coincides with the plane of motion of the pendulum as shown in Figure R3 for flexion and Figure R4 for extension tests.

(i) The moment and rotation data channels are defined to be zero when the longitudinal centerline of the neck and pendulum are parallel.

(ii) The test shall be conducted without inducing any torsion of the neck.

(4) Release the pendulum and allow it to fall freely to achieve an impact velocity of 5.2 ±0.1 m/s (17.1 ±0.3 ft/s) for flexion and 2.5 ±0.1 m/s (8.2 ±0.3 ft/s) for extension measured at the center of the pendulum accelerometer at the instant of contact with the honeycomb.

(i) Time-zero is defined as the time of initial contact between the pendulum striker plate and the honeycomb material. The pendulum data channel shall be defined to be zero at this time.

(ii) Stop the pendulum from the initial velocity with an acceleration vs. time pulse which meets the velocity change as specified in the following table. Integrate the pendulum acceleration data channel to obtain the velocity vs. time curve as indicated in Table B: